

REMARKS

Claims 38 and 45-61 are pending in the present application.

In the office action mailed December 15, 2003 (the "Office Action"), claims 38 and 52 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,001,709 to Chuang *et al.* (the "Chuang patent"). Claims 38 and 45-59 were also rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,130,102 to White, Jr. *et al.* (the "White patent").

In the office action summary, the Office Action is listed as both a final and a non-final office action. However, based on a telephone conference with the Examiner, he acknowledges that the Office Action is non-final and should have been indicated as only a non-final office action.

With respect to claims 38, 52, 60, and 61, the Examiner has argued that the limitation "having a first surface exposed to electromagnetic radiation during formation to a greater extent than a second surface of the contact," is a product-by-process limitation and considered a "non-limitation." *See* the Office Action at page 3, paragraph 3.

The Examiner's position of having a "product by process limitation" finds no support in the patent statutes, case the law, the patent rules, or the MPEP. "Product-by-process" applies to *claims*, that is, a *combination* of limitations, and not specific limitations of a claim. As such, a specific limitation in a claim cannot be ignored under the assumption that the particular limitation is a "product-by-process limitation" because there is no authority to do so. There is only reference to product-by process *claims*, the patentability of which is determined based not on the specific process in making the product, but on the product itself. Additionally, to specifically identify a claim limitation as a "product by process" limitation is contrary with the fundamental rule that the claimed invention as a *whole* must be considered. *See Jones v. Hardy*, 727 F.2d 1524, 1530 (Fed. Cir. 1984). In doing so, "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970). Consequently, the Examiner's position that the limitation "having a first surface exposed to electromagnetic radiation during formation to a greater extent than a second surface of the contact," is a "non-limitation" by virtue of being a "product-by-process limitation," cannot be maintained, and the recited structural limitation *must* be given patentable weight.

Additionally, even if the Examiner's position that a specific limitation of a claim can be construed as a "product by process limitation" is appropriate, and consequently, considered a "non-limitation," the limitation in question is not defined by a process but is defined as a structure. *Hazani v. U.S. Int'l Trade Comm'n*, 126 F.3d 1473 (Fed. Cir. 1997) is instructive in the present situation. In *Hazani*, the Federal Circuit addressed the issue of whether a claim reciting a semiconductor memory cell including a capacitor that had "an electrically conductive polysilicon first plate *having a surface* that was *chemically engraved* to have a predetermined pattern" should be construed as a product-by-process claim. (Emphasis added). The Federal Circuit held that the claims were not product-by-process claims because the "chemically engraved" limitation, read in context, "describes the product more by its structure than by the process used to obtain it." *Hazani*, at 1479.

The in-process substrate structure recited by claim 38 comprises "a selectively formed contact on each contact region, each contact being isolated from contacts on adjacent contact regions and *having a first surface* exposed to electromagnetic radiation during formation to a greater extent than a second surface of the contact." (Emphasis added). Claim 52 similarly recites, in pertinent part, an in-process semiconductor structure, comprising, among other things, "at least one selectively formed contact region on each active region, each selectively formed contact region being isolated from contacts on adjacent active regions and *having a first surface* exposed to electromagnetic radiation during formation to a greater extent than a second surface of the contact." As in *Hazani*, claims 38 and 52 provide a limitation defined in terms of a structure, and not a process. Comparing the specific language of claims at issue in *Hazani*, and the claims in the present application, the structure of the claim limitations in claims 38 and 52 are nearly identical with the language of the claim held to be "pure product claims" by the Federal Circuit in *Hazani*. *See id.* That is, in *Hazani*, the semiconductor memory cell included a capacitor comprising a first plate having the structural limitation of "a surface that was chemically engraved." Similarly, claim 38 recites an in-process substrate structure including a selectively formed contact having the structural limitation of "a first surface exposed to electromagnetic radiation." Claim 52 recites the same structural limitation of having "a first surface exposed to electromagnetic radiation." The structure of the claim limitations from *Hazani* and claims 38 and 52 are nearly indistinguishable. Thus, claims 38 and 52 cannot be

construed as a product-by-process claim in light of the Federal Circuit's holding in *Hazani*, and the structural limitation of 'having a first surface exposed to electromagnetic radiation during formation to a greater extent than a second surface of the contact' *must* be given patentable weight.

As previously discussed, the limitation, "having a first surface exposed to electromagnetic radiation during formation to a greater extent than a second surface of the contact," recited in claims 38 and 52 must be considered by the Examiner as part of the combination of limitations. However, independent of the structural limitation of the first and second surfaces, claims 38 and 52 are still patentably distinct from Chuang and White patents, either alone or in combination.

As previously mentioned, claims 38 and 52 were rejected under 35 U.S.C. 102(b) as being anticipated by the Chuang patent. Claims 38 and 52 are patentably distinct from the Chuang patent because the Chuang patent fails to disclose the combination of limitations recited by claims 38 and 52. The Chuang patent describes a semiconductor process directed to the formation of an isolation region formed from a local oxidation of silicon (LOCOS) technique. As described in the background of the Chuang patent, the conventional thermal LOCOS process results in a silicon isolation region having "bird's beak," and also causes a thinning of the oxide layer resulting in a "white ribbon effect" at the edges of the active regions formed subsequent to the oxide isolation regions. The process described in the Chuang patent utilizes a patterned "shielding layer" and the implantation of oxygen ions at a tilt angle in the formation of the LOCOS isolation regions. A thermal oxidation process is performed following implantation. *See* col. 3, lines 19-64 and Figures 2A-2C. As shown in Figure 2D and described at col. 3, line 65-col. 4, line 24, the resulting oxide isolation regions do not exhibit the same bird's beak effect as in conventional LOCOS processes and do not protrude from the surface of the substrate to the same extent as in conventional LOCOS processes.

In contrast to claims 38 and 52, the Chuang patent is directed to the formation of a LOCOS isolation region. The Chuang patent fails to describe at least a selectively formed contact on each contact region on a surface of a substrate, each contact being isolated from contacts on adjacent contact regions. The material cited by the Examiner as disclosing the combination of limitations recited in claims 38 and 52, namely col. 3, lines 19-64 and Figures

2A-2C, is directed to the formation of the LOCOS regions and does not disclose the formation of contact regions or of active regions. In fact, the Chuang patent fails to contemplate a structure having any contact regions at all or the formation of active regions. The layers 21 and 22 represent a shielding layer, and are not selectively formed contacts nor are they analogous to them. The shielding layer, as described in the Chuang patent, provides an implantation mask for the oxygen ion implantation process and are ultimately removed following the formation of the LOCOS regions. These are not selectively formed contacts, nor are they analogous to them.

For the foregoing reasons, claims 38 and 52 are patentably distinct from the Chuang patent, and therefore, the rejection of claims 38 and 52 under 35 U.S.C. 102(b) should be withdrawn.

As previously mentioned, claims 38 and 45-59 were also rejected under 35 U.S.C. 102(e) as being anticipated by the White patent.

Claims 38 and 52 are patentably distinct from the White patent because the White patent fails to disclose the combination of limitations recited in claims 38 and 52. The White patent is directed to a semiconductor process for forming a lower capacitor electrode for a ferroelectric dynamic random access memory (DRAM) and a metallic conductive plug region. The material cited by the Examiner, namely, col. 3, lines 24-67 and Figure 2, is directed to the formation of oxide isolation regions and a gate structure. As described in the White patent, the gate structure includes a gate dielectric layer 18 formed over an active region. Formed on the gate dielectric layer 18 is a gate electrode layer 20, which can be made from one or more layers of polysilicon or amorphous silicon. The sidewalls of the gate electrode are oxidized to form an oxide layer 22, and silicon nitride spacers 24 formed overlying the oxide layer 22.

In contrast, claim 38 recites an in-process substrate structure including a plurality of contact regions and a plurality of non-contact regions adjacent the contact regions on a surface of the substrate, the in-process substrate structure comprising a selectively formed contact on each contact region, each contact being isolated from contacts on adjacent contact regions and having a first surface exposed to electromagnetic radiation during formation to a greater extent than a second surface of the contact. Claim 52 recites an in-process semiconductor structure, comprising a substrate, a plurality of active regions, a plurality of isolation regions adjacent the active regions, each isolation region being positioned between adjacent active regions to isolate

adjacent active regions, and at least one selectively formed contact region on each active region, each selectively formed contact region being isolated from contacts on adjacent active regions and having a first surface exposed to electromagnetic radiation during formation to a greater extent than a second surface of the contact.

The White patent fails to disclose at least the formation of a selectively formed contact on each contact region and the formation of selectively formed contact region on an active region. As previously discussed, the Examiner has cited to material in the White patent directed to the formation of a gate electrode over an active region. The formation of the gate electrode is not analogous to the formation of a selectively formed contact. As well known in the art, a gate electrode of a metal-oxide-semiconductor (MOS) transistor is not electrically coupled to the channel region. In fact, it is quite the opposite. The gate electrode is separated from the underlying substrate by a gate dielectric, which in the White patent, corresponds to the gate dielectric layer 18. The semiconductor physics behind the operation of a MOS transistor relies on the presence of the gate dielectric, and without the gate dielectric, there would not be any transistor action. In contrast, claims 38 and 52 recite having a selectively formed contact on a contact region. As known in the art, a contact is electrically coupled to the underlying region.


For the foregoing reasons, claims 38 and 52 are patentably distinct from the White patent. Similarly, claims 45-51, which depend from claim 38, and claims 53-59, which depend from claim 52, are patentably distinct from the White patent based on their dependency from a respective allowable base claim. That is, each of the dependent claims further narrows the scope of the claim from which it depends, and consequently, if a claim is dependent from an allowable base claim, the dependent claim is also allowable. However, because each claim in an application represents an invention of different scope, the rejection of an independent claim does not necessarily result in the rejection of claims depending therefrom. Therefore, the rejection of claims 38 and 45-59 under 35 U.S.C. 102(e) should be withdrawn.

Claims 60 and 61, which depend from claims 38 and 52, respectively, are similarly patentably distinct from both the Chuang and White patents, either alone or in combination, and consequently, are in condition for allowance.

All of the claims pending in the present application are in condition for allowance.
Favorable consideration and a timely Notice of Allowance are earnestly solicited.

Respectfully submitted,

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